



2017-18

## 2.7 Series

Name \_\_\_\_\_ Date \_\_\_\_\_ Period \_\_\_\_\_

**Write each sum using summation notation, assuming the suggested pattern continues.**

1.  $-7 - 1 + 5 + 11 + \dots + 53$

2.  $2 + 5 + 8 + 11 + \dots + 29$

3.  $1 + 4 + 9 + \dots + (n+1)^2$

4.  $1 + 8 + 27 + \dots + (n+1)^3$

5.  $6 - 12 + 24 - 48 + \dots$

6.  $5 - 15 + 45 - 135 + \dots$

**Using the formula, find the sum of the arithmetic sequence. You must show work!!!**

7.  $-7, -3, 1, 5, 9, 13$

8.  $-8, -1, 6, 13, 20, 27$

9.  $1, 2, 3, 4, \dots, 80$

10.  $2, 4, 6, 8, \dots, 70$

11.  $117, 110, 103, \dots, 33$

12.  $111, 108, 105, \dots, 27$

**Find the sum of the geometric sequence. Round to the nearest thousandth if necessary.**

13.  $3, 6, 12, \dots, 12288$

14.  $5, 15, 45, \dots, 98415$

15.  $42, 7, \frac{7}{6}, \dots, 42\left(\frac{1}{6}\right)^8$

16.  $42, -7, \frac{7}{6}, \dots, 42\left(-\frac{1}{6}\right)^9$

**Find the sum of the first  $n$  terms of the sequence. The sequence is either arithmetic or geometric. Round to the nearest thousandth if necessary.**

17.  $2, 5, 8, \dots; n = 10$

18.  $14, 8, 2, \dots; n = 9$

19.  $6, -3, \frac{3}{2}, \frac{-3}{4}, \dots; n = 11$

20.  $4, -2, 1, \frac{-1}{2}, \dots; n = 12$

21.  $-1, 11, -121, \dots; n = 9$

22.  $-2, 24, -288, \dots; n = 8$

**Determine whether the infinite geometric series converges. If it does, find its sum. If it divergent explain why.**

23.  $6 + 3 + \frac{3}{2} + \frac{3}{4} + \dots$

24.  $\frac{1}{64} + \frac{1}{32} + \frac{1}{16} + \frac{1}{8} + \dots$

25.  $\sum_{k=1}^{\infty} 3\left(\frac{1}{4}\right)^{k-1}$

26.  $\sum_{j=1}^{\infty} 5\left(\frac{3}{2}\right)^{j-1}$

27. A certain species of fox has a population density growth of 5.9 per square mile, per year in a certain region. Write an explicit rule for the sequence that represents the yearly density of fox in this region if the starting density is 8 fox per square mile.

**Solve the following equations.**

28.  $\sqrt{4x-23}-3=2$

29.  $\sqrt{x-6}=x-6$

**Factor the following polynomials.**

30.  $12x^2+25x-7$

31.  $125x^3-64y^3$

**Simplify**

32.  $\frac{9}{(x-3)^2} \cdot \frac{x^2-x-6}{6x}$

33.  $\frac{x}{x^2-9} - \frac{2}{x^2-x-6}$

**Expand using the Binomial Theorem.**

34.  $(3x-2y)^5$